

### **AMENDMENT AND PRESENTATION OF CLAIMS**

Please replace all prior claims in the present application with the following claims, in which claims 11 and 12 are currently amended.

1. (Previously Presented) A method for monitoring stability of a carrier frequency ( $\omega_i$ ) of identical transmitted signals ( $s_i(t)$ ) of several transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) of a single-frequency network comprising:

receiving, by a receiver device (E) positioned within the transmission range of the single-frequency network, a signal ( $e_i(t)$ ) associated with a transmitted signal ( $s_i(t)$ ) of a transmitter ( $S_i$ ) and a reference signal ( $e_0(t)$ ) of a reference transmitter ( $S_0$ ); and

evaluating a phase position of the received signal ( $e_i(t)$ ) associated with the transmitted signal ( $s_i(t)$ ) of the transmitter ( $S_i$ ) with reference to the received signal ( $e_0(t)$ ) of the reference transmitter ( $S_0$ ).

2. (Previously Presented) A method according to claim 1, further comprising:

calculating a carrier-frequency displacement ( $\Delta\omega_i$ ) of a carrier frequency ( $\omega_i$ ) of a transmitter ( $S_i$ ) relative to a reference carrier frequency ( $\omega_0$ ) of the reference transmitter ( $S_0$ ) from a phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$ ) caused by the carrier-frequency displacement ( $\Delta\omega_i$ ) of this transmitter between a phase displacement ( $\Delta\Theta_i(t_{B2})$ ) at least at one second observation time ( $t_{B2}$ ) and a phase displacement ( $\Delta\Theta_i(t_{B1})$ ) at a first observation time ( $t_{B1}$ ) of a received signal ( $e_i(t)$ ) of this transmitter ( $S_i$ ) associated with the transmitted signal ( $s_i(t)$ ) relative to a received signal ( $e_0(t)$ ) of the reference transmitter ( $S_0$ ) associated with the transmitted signal ( $s_0(t)$ ).

3. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 2, wherein said calculating includes:

determining a transmission function ( $H_{\text{SFN}}(f)$ ) of the transmission channel from the transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) to the receiver device (E),

calculating a characteristic of a complex, time-discrete, summated impulse response ( $h_{\text{SFN1}}(t)$ ) at the first observation time ( $t_{\text{B1}}$ ) and a characteristic of a complex, time-discrete, summated impulse response ( $h_{\text{SFN2}}(t)$ ) at the second observation time ( $t_{\text{B2}}$ ) of the transmission channel respectively from the transmission function ( $H_{\text{SFN}}(f)$ ) of the transmission channel,

masking a characteristic of a complex impulse response ( $h_{\text{SFN1i}}(t)$ ) at the first observation time ( $t_{\text{B1}}$ ) and of a characteristic of a complex impulse response ( $h_{\text{SFN2i}}(t)$ ) at the second observation time ( $t_{\text{B2}}$ ) for every transmitter ( $S_i$ ) of the single-frequency network respectively from the characteristic of the complex, summated impulse response ( $h_{\text{SFN1}}(t)$ ) at the first observation time ( $t_{\text{B1}}$ ) and from the characteristic of the complex, summated impulse response ( $h_{\text{SFN2}}(t)$ ) at the second observation time ( $t_{\text{B2}}$ ),

determining a phase characteristic ( $\arg(h_{\text{SFN1i}}(t))$ ) of the complex impulse response ( $h_{\text{SFN1i}}(t)$ ) at the first observation time ( $t_{\text{B1}}$ ) and of a phase characteristic ( $\arg(h_{\text{SFN2i}}(t))$ ) of the complex impulse response ( $h_{\text{SFN2i}}(t)$ ) at the second observation time ( $t_{\text{B2}}$ ) for every transmitter ( $S_i$ ) of the single-frequency network, and

calculating the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{\text{B2}}-t_{\text{B1}})$ ) between a phase displacement ( $\Delta\Theta_i(t_{\text{B2}})$ ) at the second observation time ( $t_{\text{B2}}$ ) and a phase displacement ( $\Delta\Theta_i(t_{\text{B1}})$ ) at the first observation time ( $t_{\text{B1}}$ ) by subtraction of a phase characteristic ( $\arg(h_{\text{SFN1i}}(t))$ ) of the complex impulse response ( $h_{\text{SFN1i}}(t)$ ) at the first observation time ( $t_{\text{B1}}$ ) from a phase

characteristic ( $\arg(h_{\text{SFN}2i}(t))$ ) of the complex impulse response ( $h_{\text{SFN}1i}(t)$ ) at the second observation time ( $t_{B2}$ ) of the respective transmitter ( $S_i$ ).

4. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 3, further comprising:

increasing the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$ ) by the factor  $2*\pi$  in the case of a decrease in the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$ ) to the value  $-\pi$  or below and

reducing the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$ ) by the factor  $-2*\pi$  in the case of an increase in the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$ ) above the value  $\pi$ .

5. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 3, further comprising:

determining, in the case of digital terrestrial TV, the transmission function of the transmission channel from the transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) to the receiver device (E) from the DVB-T symbols of scattered pilot carriers of received signals ( $e_i(t)$ ) of the transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) modulated according to the orthogonal-frequency-division-multiplexing (OFDM) method.

6. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 3, wherein:

said calculating the characteristic of a complex, time-discrete, summated impulse response  $h_{\text{SFN}1/2}(t)$  at the discrete first observation time  $t_{B1}$  of the transmission channel is derived

from the transmission function  $H_{SFN}(f)$  of the transmission channel using the Fourier transform according to the formula:

$$h_{SFN1/2}(t) = \sum_{k=0}^{N_F-1} H_{SFN}(k) * e^{j2\pi kt / N_F}$$

wherein

$H_{SFN}(f)$  denotes the transmission function or respectively the frequency response of the transmission channel,

$N_F$  denotes the number of sampling values for the discrete Fourier transform,

$k$  denotes the discrete frequency values,

$t$  denotes the sampling times of the time-discrete, summated impulse response of the transmission channel and

$1/2$  denotes the index for the observation time  $t_{B1}$  or respectively  $t_{B2}$ .

7. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 6, wherein:

said calculating the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$ ) for each transmitter  $S_i$  of the single-frequency network is derived according to the formula:

$$\Delta\Delta\Theta_i(t_{B2}-t_{B1}) = \arg(h_{SFN2i}(t)) - \arg(h_{SFN1i}(t))$$

wherein

$i$  denotes the index for the transmitter  $S_i$

$\arg(h_{SFN2i}(t))$  denotes the phase characteristic of the complex impulse response  $h_{SFN2i}(t)$  at the observation time  $t_{B2}$  of the transmitter  $S_i$  and

$\arg(h_{\text{SFN}i}(t))$  denotes the phase characteristic of the complex impulse response  $h_{\text{SFN}i}(t)$  at the observation time  $t_{B1}$  of the transmitter  $S_i$ .

8. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 7, wherein:

said calculating the carrier-frequency displacement  $\Delta\omega_i$  of the transmitter  $S_i$  relative to the carrier frequency  $\omega_0$  of the reference transmitter of the single-frequency network is derived according to the formula:

$$\Delta\omega_i = \Delta\Delta\Theta_i(t_{B2}-t_{B1})/(t_{B2}-t_{B1})$$

wherein

$i$  denotes the index for the transmitter  $S_i$ ,

$\Delta\Delta\Theta_i(t_{B2}-t_{B1})$  denotes the phase position difference  $\Delta\Delta\Theta_i(t_{B2}-t_{B1})$  for the transmitter  $S_i$  of the single-frequency network and

$t_{B1}$ ,  $t_{B2}$  denote the observation times.

9. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 8, further comprising performing the following steps repeatedly:

calculating the characteristic of the complex, time-discrete, summated impulse response  $h_{\text{SFN}j}(t)$  and  $(h_{\text{SFN}(j+1)}(t))$  at the observation times  $t_{Bj}$  and  $t_{B(j+1)}$ ,

masking the characteristic of the complex impulse response  $h_{\text{SFN}ji}(t)$  and  $h_{\text{SFN}(j+1)i}(t)$  at the observation times  $t_{Bj}$  and  $t_{B(j+1)}$  for every transmitter  $S_i$  of the single-frequency network,

determining the phase characteristics  $\arg(h_{\text{SFN}ji}(t))$  and  $\arg(h_{\text{SFN}(j+1)i}(t))$  of the complex impulse responses  $h_{\text{SFN}ji}(t)$  and  $h_{\text{SFN}(j+1)i}(t)$  at the observation times  $t_{Bj}$  and  $t_{B(j+1)}$ ,

calculating the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$ ) between the phase displacement  $\Delta\Theta_i(t_{B(j+1)})$  at the observation time  $t_{B(j+1)}$  and the phase displacement  $\Delta\Theta_i(t_{Bj})$  at the observation time  $t_{Bj}$  for every transmitter  $S_i$  of the single-frequency network,

increasing the phase-displacement difference  $\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$  by the factor  $2*\pi$  in the case of a decrease in the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$ ) to the value  $-\pi$  or below,

reducing the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$ ) by the factor  $-2*\pi$  in the case of an increase in the phase-displacement difference  $\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$  above the value  $\pi$  and

calculating the carrier-frequency displacement  $\Delta\omega_{ij}$  of the transmitter  $S_i$  relative to the carrier frequency  $\omega_0$  of the reference transmitter of the single-frequency network at several observation times  $t_{Bj}$ ; and

averaging all carrier-frequency displacements  $\Delta\omega_{ij}$  of every transmitter  $S_i$  relative to the carrier frequency  $\omega_0$  of the reference transmitter  $S_0$  of the single-frequency network calculated respectively in procedural stage (S70), is implemented at the observation times  $t_{Bj}$ .

10. (Previously Presented) A method for monitoring the stability of the carrier frequency according to claim 9, wherein said averaging all carrier-frequency displacements  $\Delta\omega_{ij}$  of every transmitter  $S_i$  relative to the carrier frequency  $\omega_0$  of a reference transmitter  $S_0$  of the single-frequency network calculated in procedural stage (S70), is implemented using a recursive method.

11. (Currently Amended) A device for monitoring the stability of the carrier frequency ( $\omega_i$ ) of identical transmitted signals  $s_i(t)$  of several transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) of a single-frequency network comprising:

a receiver device,

a unit for determining a transmission function  $H_{SFN}(f)$  of a transmission channel of several transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) of the single-frequency network to the receiver device disposed within the transmission range of the single-frequency network,

a unit for implementing an inverse Fourier transform,

a unit for masking a an impulse response ( $h_{SFNi}(t)$ ) for every transmitter ( $S_i$ ) from the summated impulse response ( $h_{SFN}(t)$ ),

a unit for determining the phase characteristic ( $\arg(h_{SFNi}(t))$ ) of the impulse response ( $h_{SFNi}(t)$ ) for every transmitter ( $S_i$ ),

a unit for calculating the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$ ) of the phase displacement ( $\Delta\Theta_i$ ) of a transmitter ( $S_i$ ) relative to a reference transmitter ( $S_0$ ) at least at two different times ( $(t_{B1}, -t_{Bj+1})$ ) and the carrier-frequency displacement ( $\Delta\omega_i$ ) of every transmitter ( $S_i$ ) relative to the carrier frequency ( $\omega_0$ ) of the reference transmitter ( $S_0$ ), and

a unit for presenting the calculated carrier-frequency displacement ( $\Delta\omega_i$ ) of every transmitter ( $S_i$ ) relative to the carrier frequency ( $\omega_0$ ) of the reference transmitter ( $S_0$ ) of the single-frequency network.

12. (Currently Amended) A device for monitoring the stability of the carrier wave ( $\omega_i$ ) of identical transmitted signals  $s_i(t)$  of several transmitters ( $S_1, \dots, S_i, \dots, S_n$ ) of a single-frequency network comprising:

a receiver device,

a unit for determining a transmission function ( $H_{\text{SFN}}(f)$ ) from pilot carriers of the received signal ( $c_i(t)$ ),

a unit for masking a an impulse response ( $h_{\text{SFNi}}(t)$ ) for every transmitter ( $S_i$ ) from the summated impulse response ( $h_{\text{SFN}}(t)$ ),

a unit for determining the phase characteristic ( $\arg(h_{\text{SFNi}}(t))$ ) of the impulse response ( $h_{\text{SFNi}}(t)$ ) for every transmitter ( $S_i$ ),

a unit for calculating the phase-displacement difference ( $\Delta\Delta\Theta_i(t_{\text{Bj}+1}-t_{\text{Bj}})$ ) of the phase displacement  $\Delta\Theta_i$  of a transmitter ( $S_i$ ) relative to a reference transmitter ( $S_0$ ) at least at two different times ( $t_{\text{Bj}}-t_{\text{Bj}+1}$ ) and the carrier-frequency displacement ( $\Delta\omega_i$ ) of every transmitter relative to the carrier frequency ( $\omega_0$ ) of the reference transmitter ( $S_0$ ), and

a unit for presenting the calculated carrier-frequency displacement ( $\Delta\omega_i$ ) of every transmitter ( $S_i$ ) relative to the carrier frequency ( $\omega_0$ ) of the reference transmitter ( $S_0$ ) of the single-frequency network.

13. (Previously Presented) A device for monitoring the stability of the carrier frequency according to claim 11, wherein:

the unit for presenting the calculated carrier-frequency displacement ( $\Delta\omega_i$ ) of every transmitter ( $S_i$ ) relative to the carrier frequency ( $\omega_0$ ) of the reference transmitter ( $S_0$ ) comprises a tabular and/or graphic display device.